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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,129	06/23/2006	Peter Larsson	4147-169	3906

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EXAMINER	
HSIEH, PING Y	

ART UNIT	PAPER NUMBER
2618	

MAIL DATE	DELIVERY MODE
12/31/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,129	LARSSON ET AL.	
	Examiner	Art Unit	
	Ping Y. Hsieh	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/19/07 and 6/23/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 2, 6, 8-13, 17, 19-24, 28 and 30-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eul (U.S. PATENT NO. 5,539,749) in view of Zhang et al. ("Multiuser Detection with Cell Diversity for DS/CDMA Systems").

-Regarding claims 1 and 12 and 23 and 34 and 37, Eul discloses A multiple path information transfer method in a cellular radio network **(as disclosed in Fig. 1)**, including the steps of receiving, at several receivers connected to a transport network, radio signals representing digital information from at least one signal source **(the signal transmitted from the mobile station MS is simultaneously received by a plurality of base stations being located within the range of the mobile station MS as disclosed in Fig. 1 and further**

disclosed in col. 2 lines 23-37); compressing at least parts of the soft information of said extracted baseband signals into a de-compressible form to form compressed baseband signals **(quality value G1, G2 and G3 are associated with respective data blocks and the soft decision reliability information λ is also sent for each individual bit as disclosed in Fig. 4 and further disclosed in col. 2 lines 46-65)**; forwarding said compressed baseband signals to a combining unit over said transport network **(bit 1 and λ are forwarding to a merging unit V as disclosed in Fig. 5 and further disclosed in col. 3 lines 11-13)**; de-compressing said forwarded signals to at least approximately restore said baseband signals **(a bit by bit joining of the data block ensues in the unification unit V by means of a suitable unification method as disclosed in col. 3 lines 11-18)**; and using said de-compressed signals to at least approximately restore said digital information **(the sign function extracts the operational sign and the bit value of a give bit while the absolute value function extracts the reliability information for a give bit as disclosed in col. 3 lines 22-45)**. However, Eul fails to specifically disclose extracting, from each received radio signal, a corresponding digitized baseband signal that at least partially contains soft information.

Zhang et al. disclose extracting, from each received radio signal, a corresponding digitized baseband signal that at least partially contains soft information **(cell diversity mechanism quantizes the decision statistic into soft decisions as disclosed in paragraph II "preliminaries" lines 14-33)**.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of invention to modify the quality information as disclosed by Eul to be calculated from the cell diversity mechanism as disclosed by Zhang et al. One is motivated as such in order to reduce multiuser interference.

-Regarding claims 2 and 13 and 24, the combination further discloses the step of performing noise suppression on at least parts of said extracted baseband signals before compression **(Zhang et al., in the cell diversity mechanism, each base station employs a multiuser detector to suppress multiple access interference as disclosed in paragraph II "preliminaries" lines 14-16)**.

-Regarding claims 6 and 17 and 28, the combination further discloses said noise suppression is performed during soft output demodulation **(Zhang et al., the decorrelator removes the multiple access interference as disclosed in paragraph II "preliminaries" lines 60-61)**.

-Regarding claims 8 and 19 and 30, 35 and 38, the combination further discloses said compressing step includes vector quantization of at least parts of the soft information **(Zhang et al., cell diversity mechanism quantizes the decision statistic into soft decisions as disclosed in paragraph II "preliminaries" lines 14-33)**.

-Regarding claims 9 and 20 and 31, the combination further discloses the compression in said compressing step is lossy **(Zhang et al., use of quantizers**

results in loss in the overall SNR as disclosed in paragraph II "preliminaries" lines 76-77).

-Regarding claims 10 and 21 and 32, 36 and 39, the combination further discloses the step of selecting compression mode for said soft information at least partially based on at least one feedback signal from said combining unit **(based upon received indices, the central processor finds the corresponding log likelihood ratios and makes a decision as disclosed in paragraph II "preliminaries" lines 101-105)**.

-Regarding claims 11 and 22 and 33, the combination further discloses the step of selecting compression mode for said soft information at least partially based on channel estimates **(Eul, as disclosed in col. 3 line 61 - col. 4 line 6)**.

4. Claims 3-5, 7, 14-16, 18, 25-27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eul (U.S. PATENT NO. 5,539,749) in view of Zhang et al. ("Multiuser Detection with Cell Diversity for DS/CDMA Systems") and further in view of Valenti et al. ("Multiuser Detection with Base Station Diversity").

-Regarding claims 3-5, 14-16 and 25-27, the combination of Eul and Zhang et al. discloses all the limitations as claimed in claims 1 and 2. However, the combination fails to disclose the noise suppression is performed by log maximum a posteriori filtering.

Valenti et al. discloses a log maximum a posteriori filtering **(as disclosed in the abstract)**.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of invention to modify the noise suppression method as disclosed by Zhang et al. to be a log maximum a posteriori filtering as disclosed by Valenti et al. One is motivated as such in order to reduce the negative impact of fading.

-Regarding claims 7, 18 and 29, the combination further discloses said noise suppression is performed on the output signal from a soft output demodulator **(Valenti et al., soft –output multiuser detection can be implemented using the Maximum A Posteriori algorithm as disclosed in paragraph 3.2 "Multiuser Estimation")**.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Vadgama (U.S. PATENT NO. 7,277,709).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ping Y. Hsieh whose telephone number is 571-270-3011. The examiner can normally be reached on Monday-Thursday (alternate Fridays) 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lana Le can be reached on 571-272-7891. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

12-26-07

LANA LE
PRIMARY EXAMINER

PH